UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,772	01/22/2004	Lalit Sarna	930114.403	7534

500 7590 04/01/2008

SEED INTELLECTUAL PROPERTY LAW GROUP PLLC
701 FIFTH AVE
SUITE 5400
SEATTLE, WA 98104

EXAMINER	
REKSTAD, ERICK J	

ART UNIT	PAPER NUMBER
2621	

MAIL DATE	DELIVERY MODE
04/01/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,772	SARNA, LALIT	
	Examiner	Art Unit	
	ERICK REKSTAD	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9-11,14-17,20-22,24-26 and 28* is/are rejected.

7)☒ Claim(s) *8,12,13,18,19,23 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/28/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This is a first Non-Final Office Action for application no. 10/763,772 filed on January 22, 2004. Claims 1-28 are presented for examination.

Specification

The disclosure is objected to because of the following informalities: Page 13 Lines 19-27 indicate related applications with no application numbers.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims 9-13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 9 defines a "machine readable medium having instructions stored thereon to cause a processor" embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed readable medium can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7 recites the limitation "producer and user" and "encoder components" in claim 1. Claim 1 fails to define encoder components, a producer and a user. Claim 7 further fails to define them. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 5, 7, 9-11, 14-17, 20-22, 24-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Application Publication 2004/0117427 A1 to Allen et al. in view of US Patent 6,229,850 to Linzer et al.

[claim 1]

As shown in Figure 18, Allen teaches a method for encoding video for streaming over a network (Abstract, Paragraph [0505]). The method performs a pre-processing step (1803) which is further explained in Figure 17 (Paragraph [0497]). The pre-processor performs the operation of converting the video source to a common color format and temporally down sampling the video (Paragraph [0498]). Note, Allen teaches each operation is optional and thus independent on each other, therefore performing temporal down sampling and color format conversion may be performed in any order as the outcome is the same (Paragraph [0499]). The pre-processing is taught by Allen in order to provide a continuous pipeline for producing optimum image quality for input by multiple encoders(1805) (Paragraphs [0502] and [0503]). Allen further teaches the use of the MPEG encoding standard (Paragraph [0486]). Allen is silent on the operation of the encoders.

Linzer teaches a digital video compression method as shown in Figure 4 (Col 1 Lines 8-11). Linzer provides a means for sharing motion estimation information from one encoder to another encoder. The method includes the steps of performing full motion estimation on a first sequence of video frames and generating motion estimation data to substantially match blocks of pixels from one video frame to another video frame in the first sequence (Col 7 Lines 18-42). The First Video Compressor (34) generates a first video output using the generated motion estimation data (Col 6 Lines 5-8). Linzer further teaches reusing the generated motion estimation data to perform partial motion on at least a second sequence of video frames to substantially match blocks of pixels from one video frame to another video frame in the second sequence and modifying the generated motion estimation data to correspond to blocks of pixels in the second sequence that match (Col 6 Lines 29-38). Linzer then generates a second video output using the modified motion estimation data (Col 6 Lines 10-15). Linzer teaches the use of such a method for providing an improvement of existing video server applications as it provides a means of sharing information between encoders (Col 2 Line 64-Col 3 Line 15, Col 3 Lines 30-45 and 53-57). Linzer teach the use of the method with MPEG and other standards for delivering video over the internet (Col 2 line 64-Col 3 Line 5, Col 5 Lines 54-56). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the encoding method of Linzer for the encoders (1805) of Allen as Linzer teaches the method significantly improves the performance and capabilities of video servers (Col 4 Lines 3-13).

[claim 3]

Allen teaches a preferred embodiment which temporally sub-samples the video frames once to a common internet resolution for internet streaming (Paragraph [0484]).

[claim 5]

Allen teaches the converting of the color format to the common format (YUV 4:2:2) for use by the plurality of encoders (Paragraph [0498]).

[claim 7]

As best understood by the Examiner in view of the above 112 rejection, Linzer teaches the relationship between the producer (34) and user (38) with respect to motion estimation data (Col 6 Lines 29-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the encoding method of Linzer for the encoders (1805) of Allen as Linzer teaches the method significantly improves the performance and capabilities of video servers (Col 4 Lines 3-13).

[claim 9]

As best understood by the Examiner with respect to the above 101 rejection, claim 1 above shows Allen and Linzer teach a method of encoding multiple video outputs from a common input video source. Allen further teaches implementing the method as software (Paragraph [0547]). Allen is silent on the determining of data producer and data user relationships between encoder components and the directing output produced.

Linzer teaches the motion estimation performed by the first encoder (34) which is used by the second encoder (38) and the first encoder for compressing the video into two different encoded video streams (Col 6 Lines 22-38 and Lines 56-65). It would have

been obvious to one of ordinary skill in the art at the time of the invention to use the encoding method of Linzer for the encoders (1805) of Allen as Linzer teaches the method significantly improves the performance and capabilities of video servers (Col 4 Lines 3-13).

[claims 10 and 11]

As shown above for claim 9, Linzer teaches the first encoder (34) performs a full motion estimation using a hierarchical method (Col 7 Lines 18-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the encoding method of Linzer for the encoders (1805) of Allen as Linzer teaches the method significantly improves the performance and capabilities of video servers (Col 4 Lines 3-13).

[claims 14, 20, 21, 24, 25]

As shown in Figure 18, Allen teaches an apparatus for encoding video for streaming over a network (Abstract, Paragraph [0505]). The apparatus performs a pre-processing step (1803) which is further explained in Figure 17 (Paragraph [0497]). The pre-processor performs the operation of converting the video source to a common color format and temporally down sampling the video (Paragraph [0498]). Note, Allen teaches each operation is optional and thus independent on each other, therefore performing temporal down sampling and color format conversion may be performed any order as the outcome is the same (Paragraph [0499]). The pre-processing is taught by Allen in order to provide a continuous pipeline for producing optimum image quality for input by multiple encoders(1805) (Paragraphs [0502] and [0503]). Allen further teaches

the use of MPEG encoding standard (Paragraph [0486]). Allen is silent on the operation of the encoders.

Linzer teaches a digital video compression method as shown in Figure 4 (Col 1 Lines 8-11). Linzer provides a means for sharing motion estimation information from one encoder to another encoder. The method includes the steps of performing full motion estimation on a first sequence of video frames and generating motion estimation data to substantially match blocks of pixels from one video frame to another video frame in the first sequence (Col 7 Lines 18-42). Hierarchical motion estimation process is performed wherein output data of at least some of the encoder components can be shared as input data to other encoder components of different encoders (Col 6 Lines 29-58). Linzer generates a second video output using the modified motion estimation data (Col 6 Lines 10-15). Linzer teaches the use of such a method for providing an improvement of existing video server applications as it provides a means of sharing information between encoders (Col 2 Line 64-Col 3 Line 15, Col 3 Lines 30-45 and 53-57). It is viewed by the Examiner that the hierarchical Motion Estimation stage is also the negotiation block as the Motion Estimation determines the data sent to the different stages and to the different encoders (Col 6 Lines 43-60). Linzer teach the use of the method with MPEG and other standards for delivering video over the internet (Col 2 line 64-Col 3 Line 5, Col 5 Lines 54-56). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the encoding method of Linzer for the encoders (1805) of Allen as Linzer teaches the method significantly improves the performance and capabilities of video servers (Col 4 Lines 3-13).

[claim 15]

As shown above for claim 14, Linzer teaches the hierarchical arrangement of motion estimation units corresponds to different encoders (34 and 38). A first unit of the hierarchical arrangement can perform full motion estimation on a first sequence of video frames and generate motion estimation data to substantially match blocks of pixels from one video frame to another video frame in the first sequence and wherein a second unit of which can use the generated motion estimation data to perform partial motion on at least a second sequence of video frames to substantially match blocks of pixels from one video frame to another video frame in the second sequence and modify the generated motion estimation data to correspond to blocks of pixels in the second sequence that match (Col 6 Lines 40-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the encoding method of Linzer for the encoders (1805) of Allen as Linzer teaches the method significantly improves the performance and capabilities of video servers (Col 4 Lines 3-13).

[claim 16]

Allen teaches the use of the MPEG encoding standard (Paragraph [0486]). Linzer also teaches the use of the MPEG encoding standard (Col 5 Line 55). Linzer teaches the parts of an encoder include a motion compensator (Col 6 Lines 38-65). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the motion estimation data to a motion compensator in order to re-generate a video frame as such a step is part of the MPEG encoding process (Official Notice).

[claim 17]

Allen teaches a preferred embodiment which temporally sub-samples the video frames once to a common internet resolution for internet streaming (Paragraph [0484]). Allen teaches the converting of the color format to the common format (YUV 4:2:2) for use by the plurality of encoders (Paragraph [0498]).

[claim 22]

Allen teaches the system with an Edge server (Fig. 16). The Edge server includes means for receiving the common video data (1606) and means for transcoding the common input video data (1618). The Edge server further provides a means for transmitting the multiple video outputs to terminal devices (1624 and 1626) (Paragraphs [0482], [0484], [0486], [0488] and [0489]). Allen is silent on the hierarchical operation of the encoder components in order to perform the transcoding.

Linzer teaches a digital video compression method as shown in Figure 4 (Col 1 Lines 8-11). Linzer provides a means for sharing motion estimation information from one encoder to another encoder. The method includes the steps of performing full motion estimation on a first sequence of video frames and generating motion estimation data to substantially match blocks of pixels from one video frame to another video frame in the first sequence (Col 7 Lines 18-42). The First Video Compressor (34) generates a first video output using the generated motion estimation data (Col 6 Lines 5-8). Linzer further teaches reusing the generated motion estimation data to perform partial motion on at least a second sequence of video frames to substantially match blocks of pixels from one video frame to another video frame in the second sequence and modifying the generated motion estimation data to correspond to blocks of pixels in the second

sequence that match (Col 6 Lines 29-38). Linzer then generates a second video output using the modified motion estimation data (Col 6 Lines 10-15). Linzer teaches the use of such a method for providing an improvement of existing video server applications as it provides a means of sharing information between encoders (Col 2 Line 64-Col 3 Line 15, Col 3 Lines 30-45 and 53-57). Linzer teach the use of the method with MPEG and other standards for delivering video over the internet (Col 2 line 64-Col 3 Line 5, Col 5 Lines 54-56). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the encoding method of Linzer for the encoders (1622) of Allen as Linzer teaches the method significantly improves the performance and capabilities of video servers (Col 4 Lines 3-13).

[claim 26]

Allen further teaches the common input video data comprises raw video data (Paragraph [0482]).

[claim 28]

Allen further teaches the implementation of the system using software (Paragraph [0547]).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Application Publication 2004/0117427 A1 to Allen et al. and US Patent 6,229,850 to Linzer et al. as applied to claim 1 in view of US Patent 5,801,778 to Ju.

[Claim 2]

As shown above for claim 1, Allen and Linzer teach a method to encode multiple video outputs from a common input video source. Linzer further teaches the use of a

hierarchical motion estimation technique for obtaining the motion vectors (Col 6 Lines 29-32). Allen and Linzer are silent on the motion estimation data includes generating a motion vector indicative of a location of blocks of pixels in a current frame relative to a previous frame.

Ju teaches a hierarchical motion estimation technique which generates a motion vector indicative of a location of blocks of pixels in a current frame relative to a previous frame (Col 2 Lines 51-58 and Col 3 Lines 3-9, Col 14 Lines 18-43, Fig. 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the motion estimation method of Ju with the method Allen and Linzer as Linzer teaches the use of the method of Ju (Col 6 Line 66-Col 7 Line 4).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allen and Linzer as applied to claim 1 above, and further in view of US Patent 6,337,881 to Chaddha.

[Claim 4]

As shown above for claim 1, Allen and Linzer teach a method for encoding multiple video outputs from a common input video source. Allen is silent on the temporally sub-sampling the video frames includes temporally sub-sampling the video frames in a hierarchical manner.

Linzer teaches the outputting of video at different quality levels, where a first version may be scaled temporally while a second version is full temporal resolution (Col 5 Lines 1-11). Linzer further suggests the use of more then two encoders where in

each encoder outputs a different quality level (Col 11 Lines 8-18). Linzer is silent on sampling the temporal resolution in a hierarchical manner.

Chaddha teaches an improvement over the prior art method of generating separate data files with different characteristic levels such as frame rate (Col 2 Lines 56-65). Chaddha further teaches the use of a layer based encoder where the layers are dropped in a hierarchical manner to provide a desired frame rate (Col 6 Lines 13-22, Lines 33-41 and 49-54, Fig. 2a). Since the layer encoder of Chaddha is an improvement over the prior art of providing separate data files with different characteristic levels, it would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the method of Allen and Linzer to provide multiple encoders with a hierarchical temporal sub-sampling as Linzer teaches the use of multiple encoders with temporal scaling and Chaddha teaches such encoding is known in the prior art.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allen,Linzer and Chaddha as applied to claim 4 above, and further in view of US Patent &,272,180 to Dambrackas.

[claim 6]

As shown above for claim 4, Allen, Linzer and Chaddha teach a method for encoding multiple video outputs from a common input video source using a hierarchical sub-sampling manner. Allen is silent on the color format sampling in a hierarchical manner.

Linzer teaches the outputting of video at different quality levels, where a first version may have a reduced bit rate while a second version is a full bit rate (Col 5 Lines 1-11). Linzer further suggests the use of more then two encoders where in each encoder outputs a different quality level (Col 11 Lines 8-18). Linzer is silent on the use of color format sampling in a hierarchical manner.

Chaddha teaches a hierarchical manner of reducing the quality of the video (Col 7 Lines 35-57 and Lines 62-65).Chaddha is silent on the reducing of the quality is related to color format.

Dambrackas teaches four types of video quality reduction, one of which being color depth (Col 1 Lines 13-32). Dambrackas further teaches the reduction of color depth includes reducing the bits for each color (Col 6 Line 61-Col 7 Line 6). Note, it is viewed by the Examiner that the reduction of the color depth is a conversion of the color format. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the color depth reduction means of Dambrackas with the hierarchical sub-sampling method of Allen, Linzer and Chaddha as Dambrackas teaches the color depth reduction is one of the quality reduction means used with mpeg encoding (Col 1 Lines 13-39).

Allowable Subject Matter

Claims 8, 12, 13, 18, 19, 23, and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As shown above US Patent Application 2004/0117427 A1 to Allen and US Patent 6,229,850 to Linzer et al. teach the ability to provide multiple encoded video streams from a single source. Allen and Linzer are silent on the use of a hierarchical arrangement of human visual system based filters. This feature taken with the other features in the claims teach over the prior art of record.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERICK REKSTAD whose telephone number is (571)272-7338. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Erick Rekstad/
Examiner, Art Unit 2621